

AMENDMENTS TO THE CLAIMS

The following listing of claims will replace all prior versions and listings of claims in the application.

LISTING OF CLAIMS

1. (Previously Presented) A data transfer apparatus that receives data from an adjacent upstream data transfer apparatus and transfers the received data to an adjacent downstream data transfer apparatus, comprising:

a data reception device that receives packets that comply to dissimilar communication protocols from the upstream data transfer apparatus;

a content data extraction device that extracts content data included in a packet received by the data reception device;

a line selection information storage device in which line selection information for selecting one of communication lines that comply with dissimilar communication protocols is stored;

a line selection device that selects a communication line corresponding to the content data extracted by the content data extraction device based on the line selection information stored in the line selection information storage device; and

a data transfer device that transfers the packet to the downstream data transfer apparatus that is connected to the communication line that has been selected by the line selection device,

wherein the content data includes virtual private network information that represents a virtual private network or logical line information that represents a logical line, and

in the case in which a packet which includes contents data having a value outside a range defined in the line selection information stored in the line selection information storage device is input, in the case in which a packet which includes contents data which does not include virtual private network information is input when the content data includes the virtual private network information, or in the case in which a packet which includes contents data which does not include logical line information is input when the content data includes the logical line information, the line selection device selects a predetermined communication line.

2. (Previously Presented) A data transfer apparatus that receives data from an adjacent upstream data transfer apparatus and transfers the received data to an adjacent downstream data transfer apparatus, comprising:

- a data reception device that receives packets that comply to dissimilar communication protocols from the upstream data transfer apparatus;

- a destination information extraction device that extracts destination information that represents a destination included in a packet that has been received by the data reception device;

- a destination selection information storage device that stores destination selection information for selecting a communication line;

- a destination line selection device that selects a communication line corresponding to the destination information that has been extracted by the destination information extraction device based on the destination selection information that is stored in the destination information storage device;

a content data extraction device that extracts content data included in a packet received by the date reception device when a plurality of communication lines have been selected by the destination line selection device;

a line selection information storage device that stores line selection information for selecting one of the communication lines that comply with dissimilar communication protocols;

a line selection device that selects the communication line that has been selected by the destination line selection device when the plurality of communication lines have not been selected or selects a communication line corresponding to the content data extracted by the content data extraction device based on the line selection information stored in the line selection information storage device when the plurality of communication lines have been selected; and

a data transfer apparatus that transfers the packet to the downstream data transfer apparatus connected to the communication line that has been selected by the line selection device,

wherein the content data includes virtual private network information that represents a virtual private network or logical line information that represents a logical line, and

in the case in which a packet which includes contents data having a value outside a range defined in the line selection information stored in the line selection information storage device is input, in the case in which a packet which includes contents data which does not include virtual private network information is input when the content data includes the virtual private network information, or in the case in which

a packet which includes contents data which does not include logical line information is input when the content data includes the logical line information, the line selection device selects a predetermined communication line.

3. (Original) A data transfer apparatus according to claim 2, further comprising:

a packet analyzing device that analyzes the packet received by the data reception device when the destination information extracted by the destination information extraction device represents its own address; and

a line selection information updating device that updates the line selection information stored in the line selection information storage device based on information that has been analyzed by the packet analyzing device.

4. (Original) A data transfer apparatus according to claim 1, further comprising:

a line selection information input device that inputs the line selection information; and wherein:

the line selection information storage device stores the line selection information input from the line selection information input device.

5. (Original) A data transfer apparatus according to claim 2, further comprising:

a line selection information input device that inputs the line selection information;
and wherein:

the line selection information storage device stores the line selection information input from the line selection information input device.

6. (Original) A data transfer apparatus according to claim 3, further comprising:

a line selection information input device that inputs the line selection information;
and wherein:

the line selection information storage device stores the line selection information input from the line selection information input device.

7 – 24. (Cancelled)

25. (Previously Presented) A data transfer apparatus according to any one of claims 1 through 6, wherein:

the virtual private network information includes a VLAN identifier stipulated in IEEE 802.1Q.

26. (Previously Presented) A data transfer apparatus according to any one of claims 1 through 6, wherein:

the virtual private network information includes a VPN label that represents a VPN stipulated in RFC 2547.

27. (Previously Presented) A data transfer apparatus according to any one of claims 1 through 6, wherein:

the virtual private network information includes a VC label that represents a virtual circuit affixed to a protocol data unit.

28. (Previously Presented) A data transfer system, wherein:

a data transfer apparatus according to any of claims 1 through 6 transfers data to another data transfer apparatus according to any of claims 1 through 6 according to a relay method.

29. (Previously Presented) An edge router apparatus that is disposed at a connection between a network and the outside of the network, receives a packet from the outside of the network and transfers the packet to a router apparatus within the network, or transmits a packet from a router within the network to the outside of the network, comprising:

a switching information calculation device that obtains switching information for switching the received packet at each router apparatus positioned along a transfer path of the received packet within the network based on a destination address of the packet received from the outside of the network; and

a transmitting device that affixes to the received packet the switching information obtained by the switching information calculation device in a transfer path order starting from a router apparatus subsequent to the edge router apparatus itself,

and transmits the received packet to which the switching information has been affixed to a transfer destination router apparatus.

30. (Previously Presented) An edge router apparatus that is disposed at a connection between a network and another network, receives a packet from the other network and transfers the packet to a router apparatus within the network, or transmits a packet from a router apparatus within the network to the other network, comprising:

a routing table that stores switching information for switching the packet at each router apparatus positioned along a transfer path of the packet in the network up to the other network for each network address of the other network;

a switching information calculation device that uses a destination address of the packet received from the other network, searches the routing table, and obtains the switching information for switching the received packet at each router apparatus positioned along the transfer path of the received packet within the network; and

a transmitting device that affixes to the received packet the switching information obtained by the switching information calculation device in a transfer path order starting from a router apparatus subsequent to the edge router apparatus itself, and transfers the received packet to which the switching information has been affixed to a transfer destination router apparatus.

31. (Original) An edge router apparatus according to claim 30, comprising:

a data input apparatus for setting the switching information in the routing table.

32. (Currently Amended) A core router apparatus that receives and transfers a packet to which switching information has been affixed for switching the packet, wherein:

the core router apparatus switches the received packet ~~by the core router apparatus itself~~ based on the top piece of a plurality of pieces of switching information which are affixed to the received packet and are arranged in a transfer path order starting so as to correspond to router apparatuses which are arranged in a path from the core router apparatus itself to a network indicated by a destination address of the received packet, and the core router apparatus comprises a transmitting device that ~~transmits a packet that has had~~ deletes the top piece of the switching information used by the core router apparatus itself ~~deleted~~ so that the next piece of the switching information, which is to be used in the switching by a router apparatus which is adjacent to the core router apparatus itself, becomes the top piece of the switching information, and transmits the switched received packet to which the plurality of pieces of switching information other than the top piece of the switching information used by the core router apparatus itself are affixed.

33. (Previously Presented) A network system comprising:

an edge router apparatus that is disposed at a connection between a network and the outside of the network, receives a packet from the outside of the network and transfers the packet to a router apparatus within the network, or transmits a packet from a router within the network to the outside of the network; and

a core router apparatus that receives and transfers a packet to which switching information has been affixed for switching the packet; wherein:

the edge router apparatus comprises:

a switching information calculation device that obtains the switching information for switching the received packet at each router apparatus positioned along a transfer path of the received packet within the network based on a destination address of the packet received from the outside of the network; and

a first transmitting device that affixes to the received packet the switching information obtained by the switching information calculation device in a transfer path order starting from a router apparatus subsequent to the edge router apparatus itself, and transfers the received packet to which the switching information has been affixed to a transfer destination router apparatus; and

the core router apparatus comprises:

a second transmitting device that switches the received packet in the core router apparatus itself based on the switching information that has been affixed to the received packet in a transfer path order starting from the core router apparatus itself, and transmits a packet that has had the switching information used by the core router apparatus itself deleted.

34. (Previously Presented) A network system comprising:

an edge router apparatus that is disposed at a connection between a network and an another network, receives a packet from the other network and transfers the

packet to a router apparatus within the network, or transmits a packet from a router apparatus within the network to the other network; and

a core router apparatus that receives and transfers a packet to which switching information has been affixed for switching the packet; wherein:

the edge router apparatus comprises:

a routing table that stores switching information for switching the packet at each router apparatus positioned along a transfer path of the packet in the network up to the other network for each network address of the other network;

a switching information calculation device that uses a destination address of the packet received from the other network, searches the routing table, and obtains the switching information for switching the received packet at each router apparatus positioned along the transfer path of the received packet within the network; and

a first transmitting device that affixes to the received packet the switching information obtained by the switching information calculation device in a transfer path order starting from a router apparatus subsequent to the edge router apparatus itself, and transfers the received packet to which the switching information has been affixed to a transfer destination router apparatus; and

the core router apparatus comprises:

a second transmitting device that switches the received packet in the core router apparatus itself based on the switching information that has been affixed to the received packet in a transfer path order starting from the core router apparatus itself, and transmits a packet that has had the switching information used by the core router apparatus itself deleted.

35. (Original) A network system according to claim 34 wherein:

the edge router apparatus provides a data input apparatus for setting the switching information in the router table.

36. (Original) A network system according to claim 34, wherein:

the edge router apparatus comprises:

a first reporting device that reports a network address of the other network connected to the edge router apparatus itself and switching information to the other network to a core router apparatus or another edge router apparatus connected to the edge router apparatus itself as path information; and

a creating device that receives the path information that has been reported from the core router apparatus or the other edge router apparatus connected to the core router apparatus itself, and creates the routing table based on the received path information; and

the core router apparatus comprises:

a second reporting device that affixes switching information for an edge router apparatus or a core router apparatus that have transmitted the path information to the received path information, and reports the path information having affixed the switching information to core router apparatuses and edge router apparatuses other than the edge router apparatus and the core router apparatus that have transmitted the path information among core router apparatuses and edge router apparatuses that are connected to the core router apparatus itself.